



US Army Corp
of Engineers
Sacramento Dist

Isabella Dam

Main Dam

Auxiliary Dam

Spillway





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Locations of Sacramento District dams

ISABELLA DAM





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Isabella Dam

- Isabella Dam: Top Risk
- Dam purposes and basic facts
- The Dam Safety Deficiencies
 - Hydrologic (overtopping)
 - Seismic
 - Seepage
- Reservoir Restriction & local coordination
- Timeline for dam safety remediation project
- Funding



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Isabella Risk

Probabilities + Consequences = Risk

✓ i.e., Large downstream population +
Significant dam safety issues =
High Risk



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Isabella Risk

Screening Portfolio Risk Assessment (SPRA)

- 2005/06 USACE screened probable “top 20%” in terms of risk
- First time Corps ranked its dams for life risk.



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Primary Purposes

- Flood control (~ 79%)
- Irrigation (~21%)



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Dam Construction





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Dam Construction

- Construction: March 1948 – Feb. 1953
- Two dams:
 - 185-foot-high main dam
 - 100-foot-high auxiliary dam
- Both dams are rolled, compacted earthfill
- 568,000 ac ft when full





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Isabella Dam

Main Dam

Auxiliary Dam

Kern River

Hot Springs Valley

Town of Lake
Isabella



Pointer 35°38'18.24" N 118°28'23.32" W elev 2541 ft

Streaming 100%

©2005 Google

Eye alt 17085 ft



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Deficiencies - Hydrologic

Undersized spillway

- only safely passes 33% of worst case flood

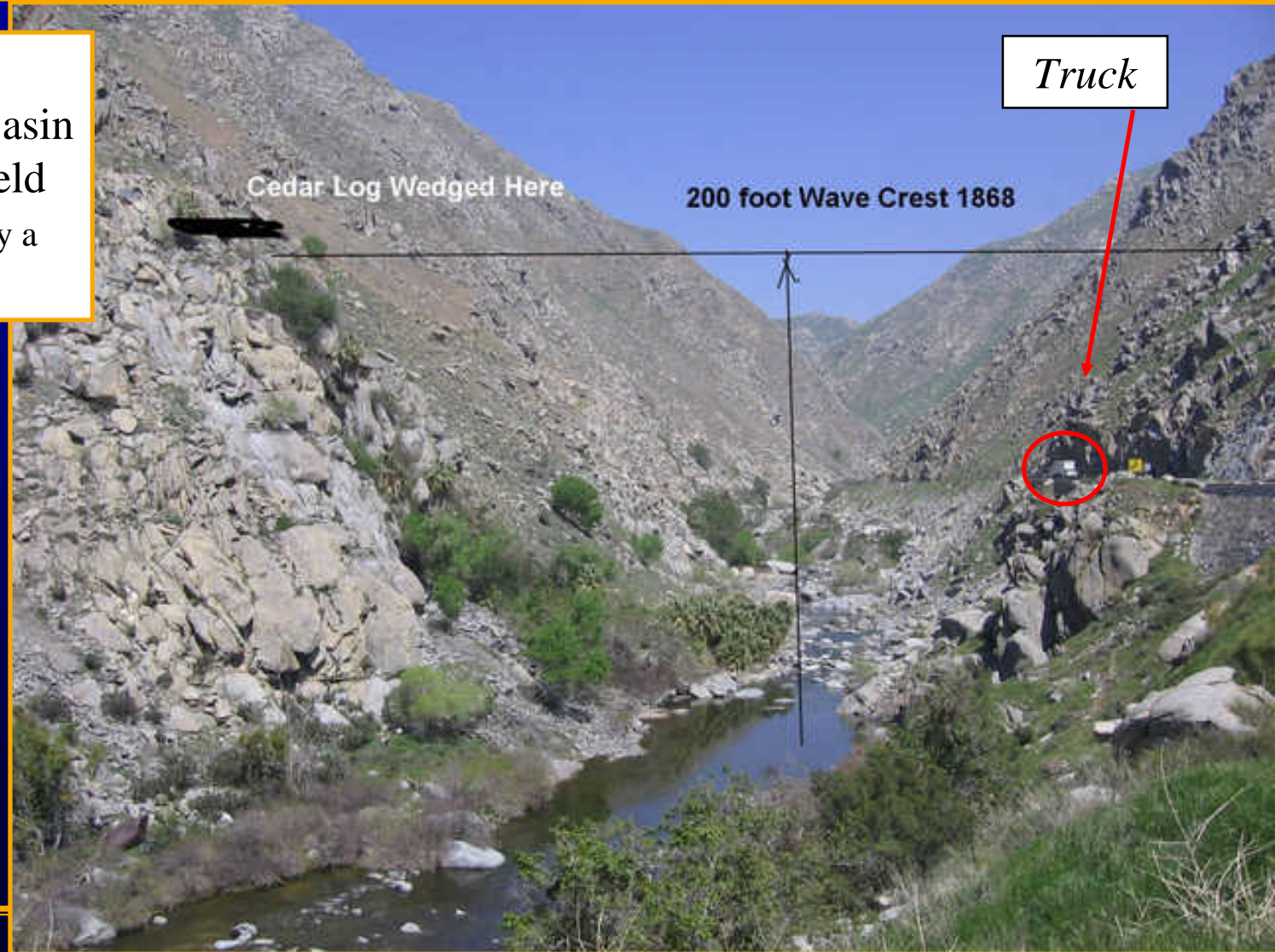




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Deficiencies - Hydrologic

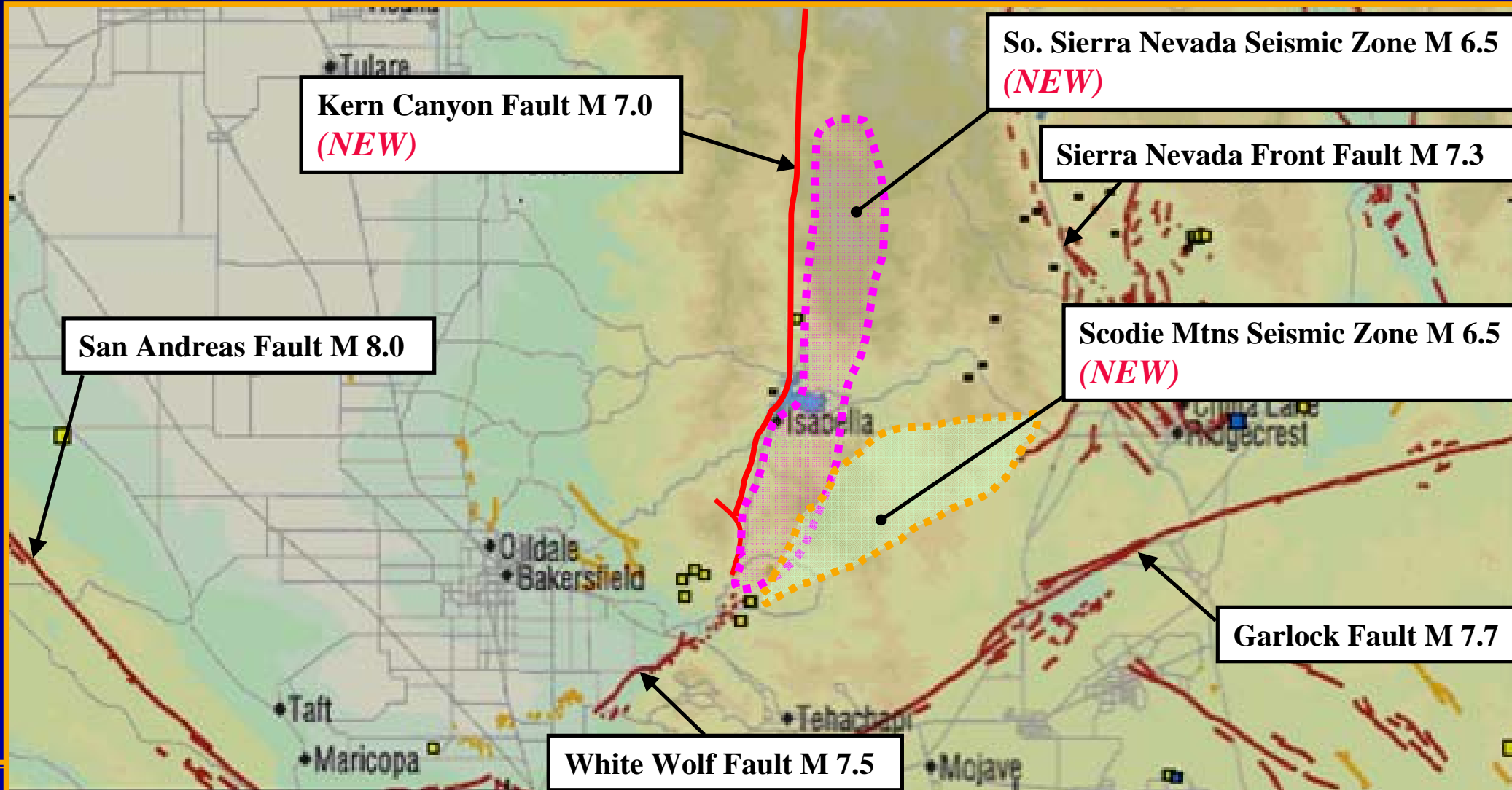
There is a history of large floods in the Kern River Basin – this is from the Bakersfield Californian (log decayed away a long time ago)





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Deficiencies - Seismic

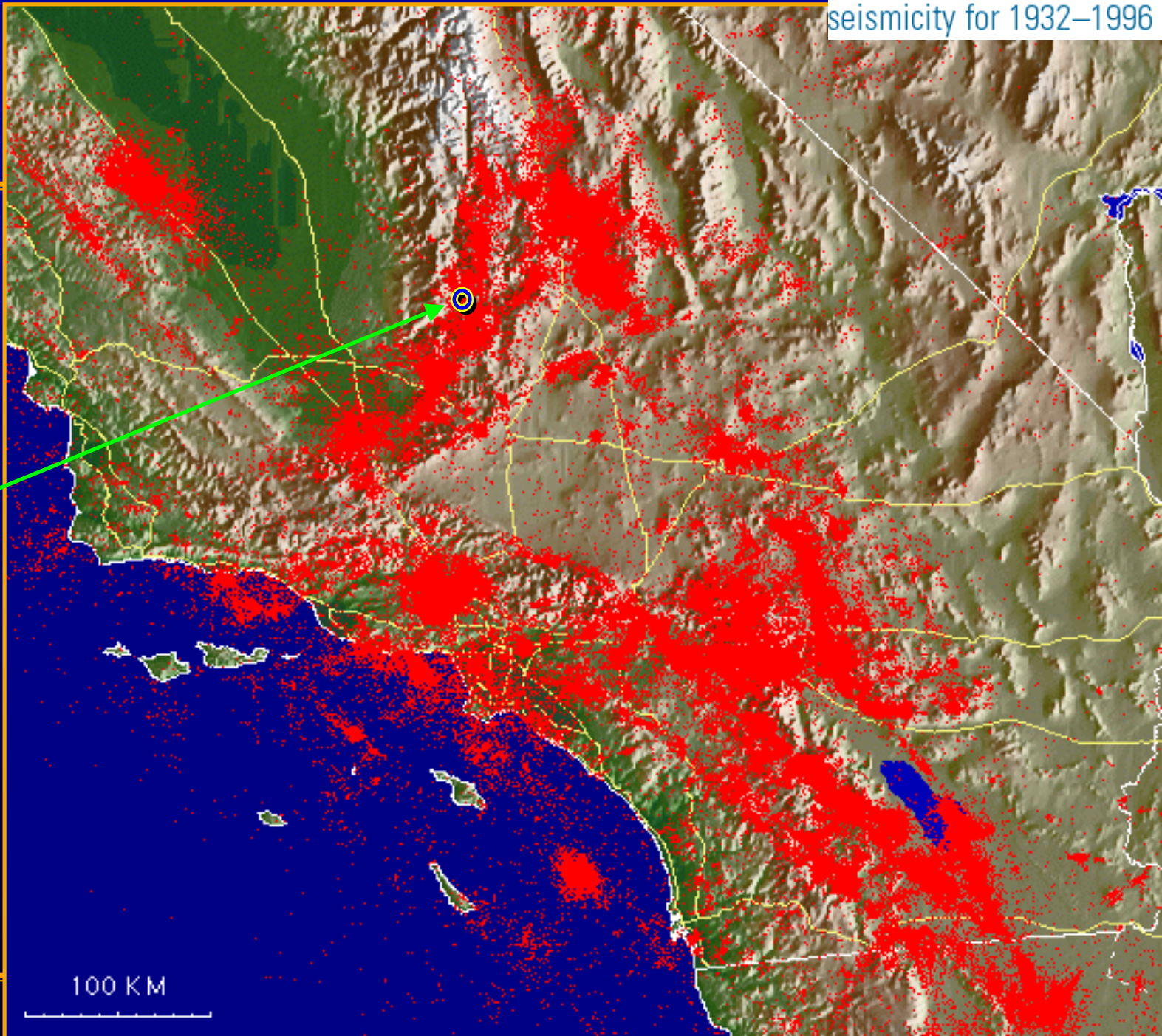




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seismicity for 1932–1996

Deficiencies - Seismic Lake Isabella



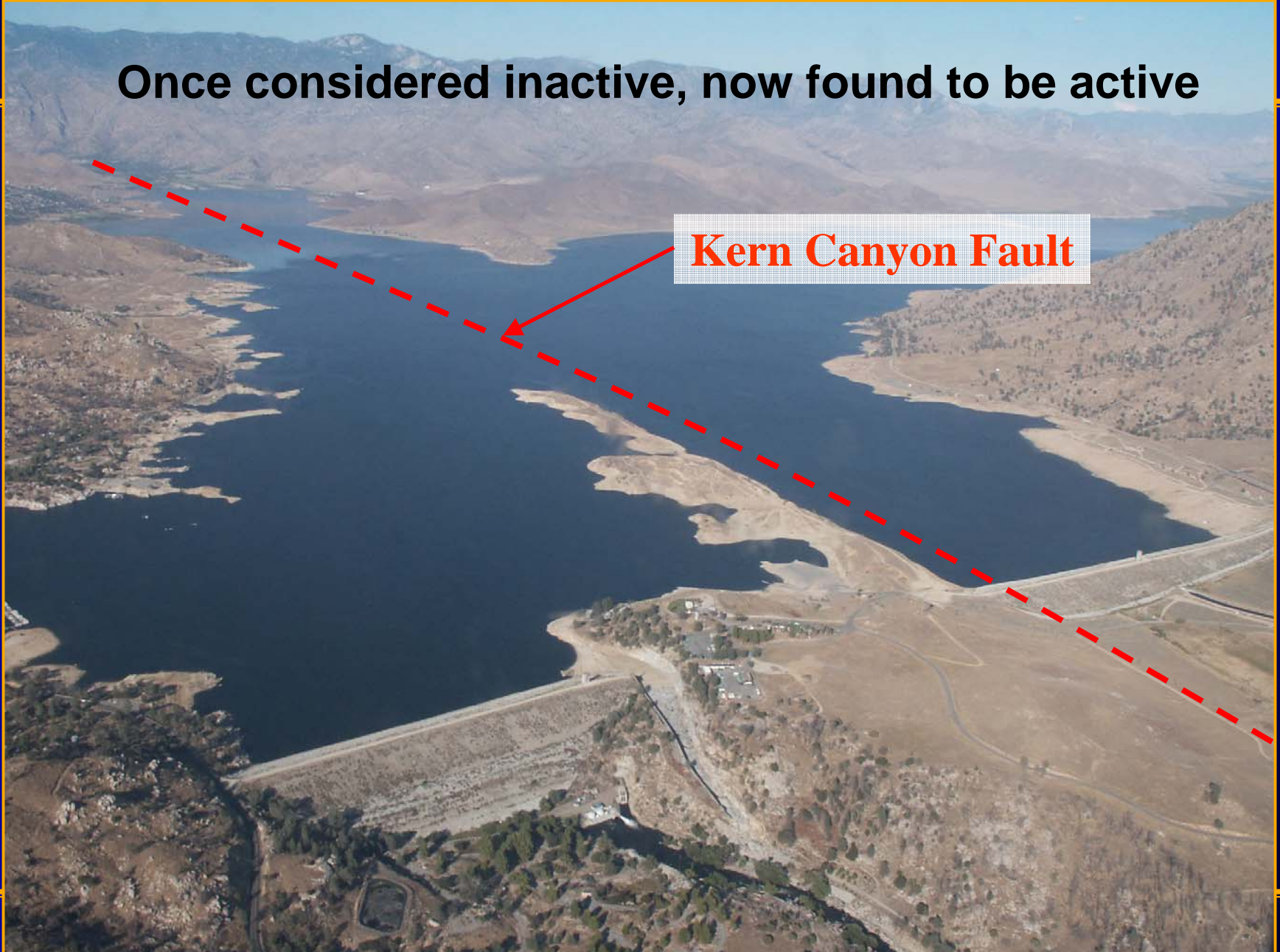


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Deficiencies - Seismic

Once considered inactive, now found to be active

Kern Canyon Fault





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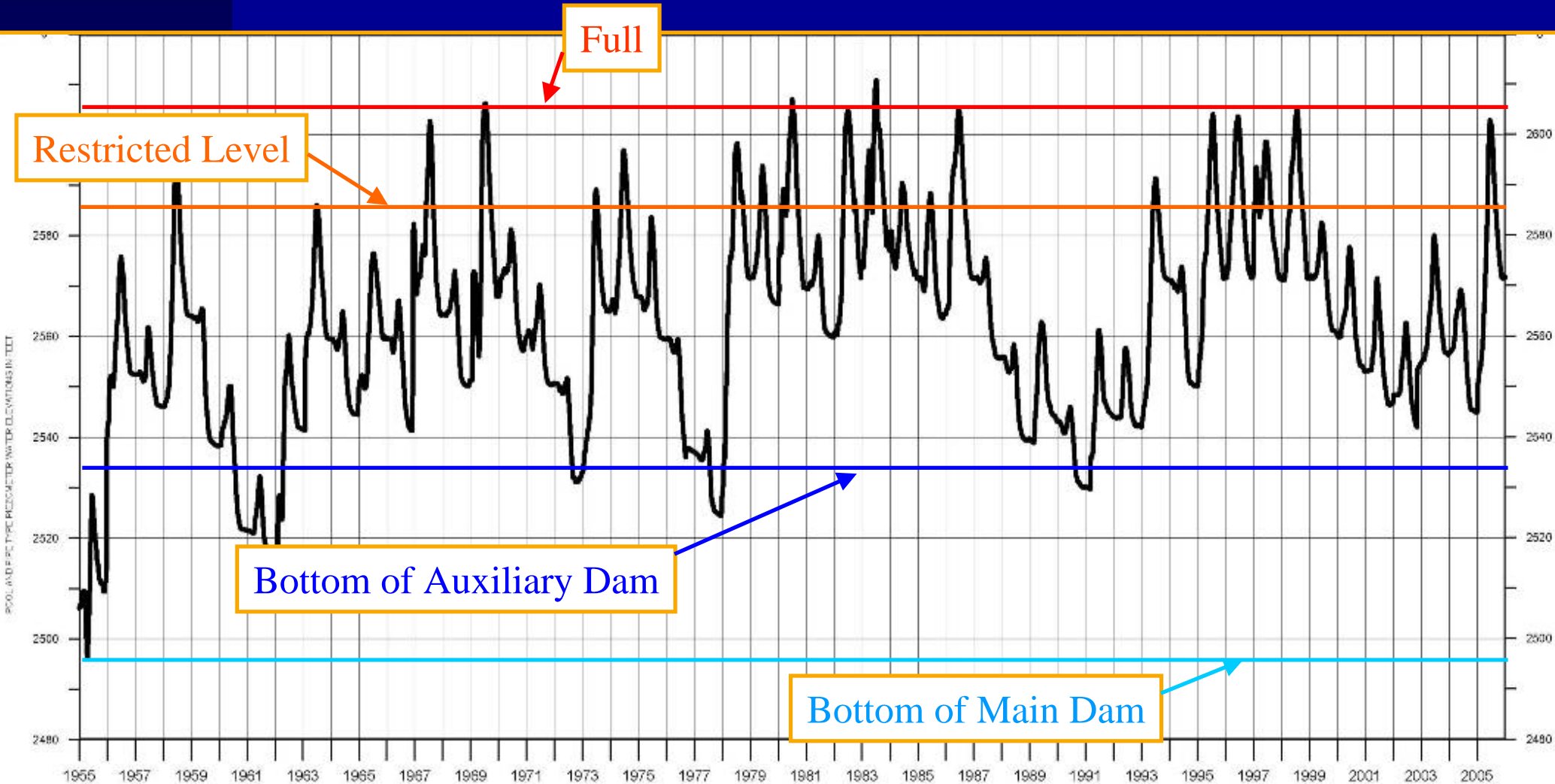
Deficiencies - Seepage

- Dam Safety Assurance study underway when seepage problem (auxiliary dam) discovered
- Review panel: 20 ft restriction on *max* pool elevation
- Implemented 27 April 2006
- Restricted elevation = 64% capacity
- Will not apply in 3/5 years (on average)



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Reservoir Restriction





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Coordination

- We will continue to communicate with local interests and evaluate the restriction
- SitReps sent every two weeks
- We remain sensitive to issues of loss of water and impact to local economy
- Life safety comes first



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Timeline

- Estimated time for remediation

Study = 2-3 years

Design = 2 years

Construction = 3 years

- Preliminary: Not enough information yet
- Complicated: Multiple deficiencies, 2 dams



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Timeline

Other major Dam Safety remediations

- CA DSOD –
 - “plan for 10 years”
- USBR
 - “plan for 10 years”
- Reviewed several case histories, all > 10 years



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Funding

Dam Safety Funds only – this is above the normal annual project needs of ~ \$2.05M

- FY2005 - \$280,000
- FY2006 - \$900,000
- FY2007 - \$4M
 - Limit of capability to efficiently expend
 - Reflects balance of data collection, and being able to analyze the data
- FY2008 - \$7M requested (expect to receive)



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Summary

- Isabella Dam is top risk dam in Corps inventory
- We are moving aggressively with the investigation, design and remediation
- The “fix” will take some time, even with significant funding
- Working with local interests



Summary

- Isabella dam – history of performance
 - Built properly to the standards of the time, but much has been learned since construction
 - 54 years of operation
 - >\$222 Million in flood damages prevented (not inflation adjusted!)
 - Levee capacity in Bakersfield would likely have been exceeded in 13 years (in Dec 1966, flows into lake were over 110K cfs – channel capacity in Bakersfield is ~10K)
 - Value of irrigation water, other economic benefits
 - In it's history, the dam has been a huge success and positive benefit – it now needs to be upgraded to modern standards



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